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A CONTRIBUTION
TO THE
STUDY OF CYSTS OF THE VAGINA,
WITH THE REPORT OF A CASE.

BY
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Woman's Clinic of the Central Dispensary and Emergency Hospital; Member of
the Alumni Association of the Woman's Hospital in the State of New York.

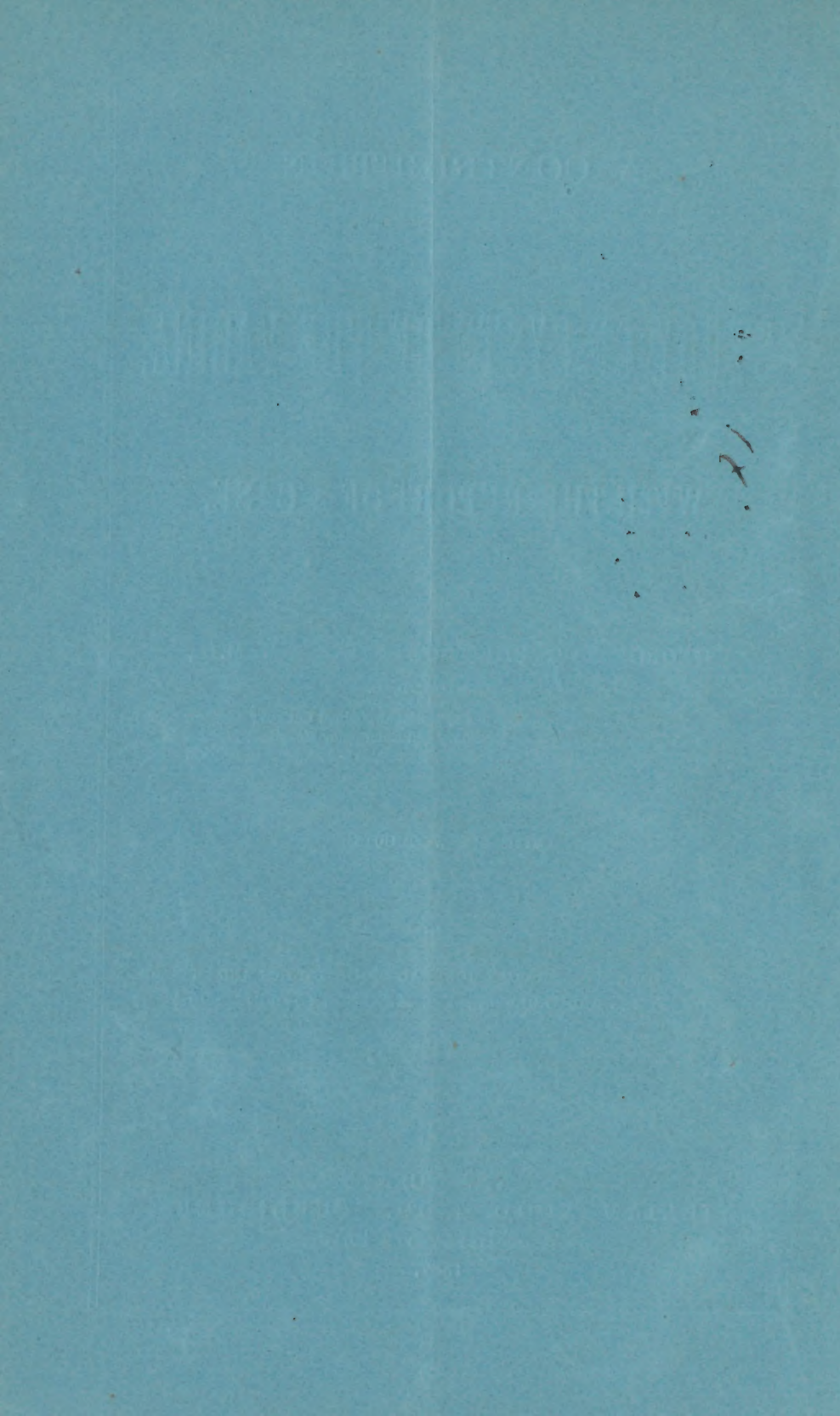
(WITH SIX WOODCUTS.)



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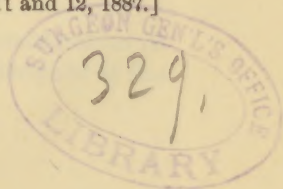
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(With six woodcuts.)

THERE are two kinds of vaginal cysts, those which contain *liquid* and those which contain *air*.

The following pages are devoted solely to a consideration of cysts of the vagina with liquid contents. The literature of the entire subject is, however, appended.

1. *History.*

Haller, who wrote in 1765, said: "I have found hydatids in the vagina, which fact contradicts the opinions of Morgagni." Haussmann, a century later, maintains that by hydatids Haller meant cysts, and that he would have framed his views in different language had not the existence of these for-

mations been recognized long before his time. Safford Lee is inclined to regard Sir Astley Cooper as the one who first took cognizance of and described cysts of the vagina, and Meissner (1848) is of the same opinion; but Winckel (1871) was unable to find any reference to them in his works.

Within the last fifty years, there have appeared from time to time, mainly in the pages of foreign periodicals, brief notices of this somewhat rare affection, while Huguier in 1847, and Winckel in 1871, presented the fruits of more careful and elaborate study.

An analysis of the histories of one hundred and sixty-two cases of vaginal cysts forms the basis of the present contribution.

2. *Pathological Anatomy.*

Cysts of the vagina have been found with a varying degree of frequency by different observers. While it is believed that they are by no means rare or phenomenal (Klebs), and occur more often than is usually supposed (Hart and Barbour), Breisky has encountered but eight true and one doubtful case, and Duncan thirty. Fritsch considers that in thorough examinations, such as those made of prostitutes, vaginal cysts are met with in about one per cent of all cases examined.¹

Others have found them more common; thus Graefe saw in one year nearly twenty cases, while Von Preuschen in thirty-six bodies, found cystic formations in the vagina six times.

At the Woman's Clinic of the Central Dispensary in this city, five hundred patients were examined during the past year, and vaginal cysts found in but one case.

Cysts of the vagina usually occur singly; occasionally two may be present at the same time, or more rarely still, three, four, five, or even six.

Opinion is divided as to the vaginal wall oftenest the seat of cysts. Two of the earlier observers, Huguier and Ladreit, maintain that the anterior wall is most frequently affected—compared to the posterior as 13:8—and the results obtained by Winckel would seem to support this view, which is further confirmed by Dupuy, Eustache, Guérin, Hart and Barbour, and others. There are, however, some, Von Preuschen, Dentu,

¹ In 11,140 women with tumors of the genitalia, cysts of the vagina were found 3 times (Gurlt).

and Froment, who believe that cysts are most usually met with on the posterior wall of the vagina, and Klebs in thirty cases found the posterior wall named twenty times. The lateral vaginal walls are less commonly the seat of cystic disease than either the anterior or the posterior; all are agreed on this point.

In the one hundred and sixty-two cases collected, the tumor was seated on the anterior wall sixty times, on the posterior fifty-seven times, and on the lateral walls eighteen times. The right and left lateral walls were affected with equal frequency.

It is quite possible for cysts to be present simultaneously on opposite walls of the vagina, as in the cases of Bidder and Wassilly, Collardot and Eustache; and in the histories detailed by Burke, Graefe, Gosselin, Næcke, Pichancourt, and Tillaux, we find illustrations of the fact, emphasized by Graefe, that cysts, particularly if of large size, do not lie exclusively on one wall of the vagina, but encroach upon those adjoining, so that it becomes more or less difficult to ascertain their true seat of origin.

Cysts are not always located on the same part of the vaginal wall. The researches of Winckel have led him to believe that the most usual seat of cysts of the vagina is in the lower half of that organ, two-thirds of all cysts being there found. Breisky, Dentu, Duncan, Dupuy, Hart and Barbour, and Schulte are of the same opinion. So far as we are aware, Von Preuschen is the only observer who regards the upper third of the vagina as the common location of cysts.

From our own observations it would seem that one meets with these tumors almost as often in the upper as in the lower third, for in one hundred and sixty-two cases the cyst occupied the lower third in thirty-eight, the upper third in thirty-one; while the middle third was involved in seventeen, and the entire vaginal wall in eleven.

Certain vaginal cysts, especially those that are of small size or are deeply seated, project so little into the lumen of the vagina as almost to pass unrecognized, even on the most careful examination. As a rule, however, when furnished with firm walls, or distended with fluid, they are quite perceptible as round, hemispherical, or globular elevations, rising sharply above the plane of the surrounding vaginal surface. Occasionally the shape may vary somewhat, and the cyst be ovoid, or

elongated in a direction parallel with, or transverse to, the long axis of the vagina. *Fig. 1.*

The mucous membrane covering vaginal cysts often preserves its normal appearance and color, and is said to be rosy, reddish, bluish-red, or red; still it is frequently spoken of as being pale-red, or as paler than the surrounding mucous membrane. Again, if it be much stretched, it loses its characteristic wrinkles, and becomes smooth, shining, and glossy.

Along with the proper cyst wall, which it may cover or of which it may form an essential part, the mucous membrane may become so thinned that the cyst acquires a whitish,

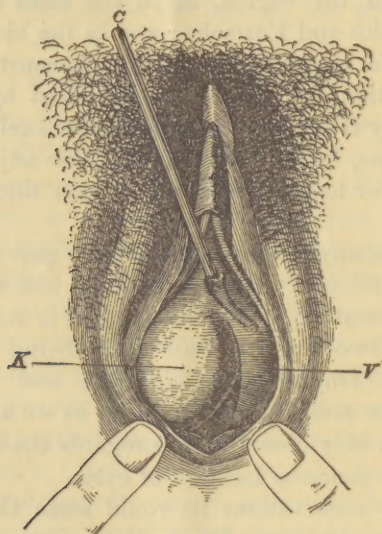


FIG. 1. (After Sevrat.)

bluish-white, or greenish-white appearance, not unlike that of a serous membrane or the outside of an ovarian cystoma. It has also been likened to a distended intestine, or to a glans penis habitually uncovered by prepuce. When a cyst prolapses and protrudes through the vulvar fissure, the mucous membrane covering it exhibits the same epidermoidal change which affects either vaginal wall under like circumstances, or it may become inflamed and show superficial ulceration, as is seen when two cysts lie directly opposite each other in the vagina.

The cysts may ever remain small, the size, let us say, of the

space, natural or artificial, in which the fluid accumulates. On the other hand, when the conditions favorable to growth are present, they may increase in size. After a certain time, the cystic sac having reached the limit of its capacity, further accumulation will cease, and the enlargement remain stationary.

Thus in one case after four weeks, in another after six weeks, in another after three months, and in another after twenty-two years, no increase in size was noted.

In any event, all growth is slow,¹ as is the rule in cystic tumors generally, and the patient may be conscious of the existence of a vaginal cyst for a considerable length of time.

Warren records a case in which the vaginal tumor was observed for several months; Gosselin, for 5 or 6 months; Hutchinson, a cyst which for 18 months had gradually increased in size; Bradfield, for nearly 2 years; Simpson, for 3 years; Kaltenbach, for 4 years; Kolaczek, for 5 years; Fürst, a cyst which little by little had increased for 5 years; Watts, for 6 years; Warren, for 7 years; Eustache, for 8 years; Hugnier, for 17 years; Tillaux, for 22 years; Lee, for a number of years.

The only exception to this rule is furnished by Hörder, who mentions an instance in which a cyst, within a half-year, grew with great rapidity.

There are several conditions which influence rapidity of growth in this species of cystic disease, notably the density and elasticity of the walls of the cavity in which the fluid accumulates, and the activity of this accumulation. The first of these conditions is modified by the anatomical position of the starting point of the cyst, and the second, by various physiological and pathological processes. The prolonged hyperemia, which is a necessary accompaniment of utero-gestation, is a potent factor in hastening the development of vaginal cysts; they rapidly increase during pregnancy, especially within the last few weeks, and attain their maximum size at the moment of labor.² After delivery, there may be further enlargement, occurring swiftly or slowly, or the cyst may undergo a species of involution and grow smaller. The irritation of excessive sex-

¹ Winckel says a cyst may require seven or eight years to reach the size of a hen's egg, and quotes three cases in illustration.

² Cases of Lever, Moliner, Mundé, Pichancourt, Schulte, and Warren.

ual intercourse, and inflammation of the vaginal texture, likewise stimulate normal and morbid secretion, and accelerate the growth of cysts. After the menopause, when the vital activity of the sexual organs is diminished, cysts develop slowly.

When the conditions just mentioned as favoring growth are present, especially if the cyst be deep-seated and have firm walls, it will decidedly increase in size, and may even reach enormous proportions.¹ In describing the size of cysts, observers have used, for the sake of comparison, the names of a large number of natural objects with which we are all familiar, and only in a very few instances have exact measurements been made. As a rule, the cysts described have a relatively large size: Winckel says that three-fourths of all cysts are from the size of a walnut to that of a fist, while Näcke believes that tumors which are of large or medium size, are found three times as often as the smaller ones. This circumstance is no doubt due, as Winckel points out, to the fact that when cysts are small they generally pass unrecognized.

At whatever point cysts of the vagina originate, the tendency of growth is naturally in the direction of least resistance, or first toward the lumen of the vagina, and then toward its exit. This manner of development is further made necessary by the fascial attachments of the vagina, by the force of gravity acting from below, and by the negative resistance or positive pressure of the adjacent and overlying hollow organs—the bladder, intestines, and rectum. Still, it is possible for the cyst to grow upward, and to present both as a vaginal and as an abdominal tumor, or to develop backward and form quite a distinct prominence in the rectum.

Cysts of the vagina are most often sessile, but if the tissues at their base be lax, the constant traction will in time produce pediculization. On account of the greater firmness of the attachments of the anterior vaginal wall, it seldom yields, and cysts seated upon it are apt to remain sessile. The posterior wall, however, not so stably fixed, is, with greater frequency than the anterior, the seat of polyp-like cysts. Deep lying cysts, as well as those that are superficial, may be thus affected.

In 162 cases of vaginal cysts, there were 16 pedunculated, of which number 3 sprang from the anterior, and 11 from the

¹ Cysts have been described which were as large as a fetal head at term, others are said to have been "as large as a child's head."

posterior wall; the origin of the remaining 2 was not specified. The pedicle in 3 cases is described as large, and in 1 the size of a little finger, and in 1 extensible and of an hour-glass shape, in another as being like a hard cord. On the other hand, if the tumor continues to increase in size, and there be no extensibility of its base, it may so drag upon the vaginal wall as to cause it to prolapse and with it the uterus also. Other influences favoring descent are, in addition, often active.



FIG. 2. (After Fürst.)

Prolapse of the vaginal wall, manifestly or presumably the result of the weight of the tumor, is to be met with in 12 of 162 cases, and prolapse of the uterus, attributable to the same cause, in 6.

A cyst which is seated low upon the vaginal wall, or one that has become pediculated or prolapsed, may present at the vaginal outlet, or protrude for some distance between the labia, or even hang downward between the thighs. *Figs. 2 & 3.*

It is maintained that cysts of the anterior vaginal wall do

not usually extrude from the vulva (Dresch). In 32 cases coming under our notice, in which the tumor occupied the vaginal inlet or depended from it, the cyst in question was found to originate on the lateral wall twice, on the posterior wall 12 times, and on the anterior wall 17 times; in 1 instance the seat was not specified.

Cysts of the vagina are occasionally quite movable, and those which from any cause escape from the vulva, readily re-enter it and disappear, when pressure is made upon them. This has been observed in nineteen instances, and may occur spontaneously when the patient assumes the recumbent posture. Protrusion in all cases is induced or rendered conspicuous by coughing, crying, by efforts at micturition or defecation, by



FIG. 3. (After Watts.)

bearing down or straining, or when the individual stands or walks. Rarely (in four cases), pressure upon the tumor failed to alter its position, or did so but slightly and with difficulty.

On examining cysts of the vagina by touch, it is found that the mucous membrane investing their vaginal aspect glides freely over them, except when it forms an integral part of the sac wall, or has become united to it by some previous inflammation. The impression given to the examining finger by the cyst itself has been variously described: it has been recorded in fifty-seven instances.

Ordinarily it is soft, elastic, and fluctuating, while in seventeen cases it was said to be firm, resistant, and devoid of fluctuation, and in one, the growth felt like a hard, fibrous tumor.

Inflammation of the sac, and the change of the cyst into an abscess, may result from the injuries of labor,¹ or in the case of those tumors that have escaped from the vaginal inlet, as a consequence of repeated blows between the thighs on walking.² It is said that the friction of two cysts seated opposite each other on the vaginal walls will produce a like issue, but in the only three cases illustrative of this condition of which we are aware, no mention is made of any such pathological alteration.³ The irritation of simple exploratory puncture is often enough to induce inflammatory changes,⁴ but in many instances it is not always easy to discover the true exciting cause.

Cysts of the vagina may burst spontaneously or be ruptured, and discharge their contents into the vagina, urethra, or through the perineum. Fourteen cases of this accident are to be found in recent literature, the vagina being involved in eleven, the urethra in two, and the perineum in one. Perforation is usually a consequence of inflammation of the walls of the sac, but the pressure of the descending head of the child during labor, or injuries otherwise inflicted, may also produce rupture of the cyst.

After the cyst has been evacuated it may disappear, or what is more likely, the opening will close and the cyst refill, until it sometimes attains dimensions equal to those it originally possessed. On the other hand, the opening may remain patulous, and form the terminal extremity of a sinus, lined by unhealthy granulations, and discharging continuously a fetid, purulent fluid.⁵

Now let us turn to a consideration of the more minute structure of cysts of the vagina, and of the various theories that are entertained as to their mode of origin.

Of late the opinion has been repeatedly expressed that, through microscopical examination of the walls of these formations, and by this means alone, could the vexed question of their mode of origin be settled. The same hope was entertained by older observers, but it was through a study of the contained fluid that they sought to reach this end. It is to be

¹ Case of Hickinbotham.

² Case of Dentu.

³ De Sinéty. Cases of Bidder and Wassily, Collardot, and Eustache.

⁴ Cases of Gosselin, the Author, and Lee.

⁵ The rupture of cysts is further discussed by Collardot, Eustache, Froment, Klebs, Mundé, De Sinéty, Thalinger, and Winckel.

feared that in neither way can conclusions free from doubt be attained.

Cysts of the vagina, whatever be their origin, have, most commonly, a proper and independent wall. When the cystic development is due to an accumulation of fluid in a cavity or space which has distinct walls of its own, this is easily understood. When there is an effusion of fluid into meshes of tissue, as is seen in the case of loose vaginal surroundings, the irritation incident to its presence sets on foot processes resulting in encapsulation.

The external or vaginal aspect of all cysts is clothed with that form of epithelium which invests the mucous membrane of the vagina. Besides this, any or all of the tissue elements of the vagina may be found in the cyst-wall, its thickness depending on the number of these tissue layers present, and the latter upon the situation of the point at which the accumulation originates, and the degree of pressure which it exercises. Thus the wall may be so thin as to be quite translucent, allowing the small vessels ramifying in its structure to become apparent, or so thick that it will fail to collapse even after puncture and withdrawal of the cystic contents. Still, as has been remarked, the cyst-wall is really thicker than one would expect from its external aspect, for the appearance of translucency is in great part due to the peculiar coloration of the vagina. In a large number of cases the cyst is simply said to have had a thick or a thin, a strong or a weak wall, but from those in which measurements have been made, 0.5 mm. is seen to be the minimum, and 1 cm., the maximum thickness observed.¹

As a rule the interior aspect of vaginal cysts, which may be

¹ Case of Lebedeff, thickness 0.5 mm.

" " Graefe	" 0.7 mm.
" " Lebedeff	" 1 mm.
" " Ladreit	" 1-4 mm. quoted by Winckel.
" " Graefe	" 2 mm.
" " Dresch	" 2 mm.
" " Graefe	" 2-3 mm.
" " Gotthardt	" 2-3 mm.
" " Kolaczek	" 3-5 mm.
" " Schulte	" 4-5 mm.
" " Hörder	" 5 mm.
" " Lisfranc	" 7 mm. quoted by Winckel.
" " Graefe	" 1 cm.

either smooth and shining or rough and covered with papillary outgrowths, is provided with ^aepithelial investment, although cases are recorded in which all such was wanting (Huguier, Ladreit, Lebedeff, and Verneuil).

Now, as has been elsewhere stated, the hope was entertained that through a careful microscopical investigation of the walls of vaginal cysts, and especially by the characteristics, thus revealed, of their epithelial lining, some accurate information could be gained as to their etiology, and an anatomical basis for their proper classification established. The fact, however, that two distinct varieties of epithelium can be present on the internal face of one and the same cyst, as Ruge has clearly demonstrated in three of Graefe's cases, and as has also been observed in those of Kaltenbach and Lebedeff, does not a little to quench this hope.

Furthermore, we have convincing evidence before us, that the very nature of the epithelium may be changed by the mechanical pressure of the contained fluid. By this means, as has been pointed out by Graefe, a cylindrical-celled epithelium may be so flattened as to assume a simple pavement form, and this by multiplication of its upper strata becomes in turn a many-layered pavement epithelium—a process which is met with in cysts elsewhere, and has its prototype in the embryonal development of the vagina.

If, therefore, these facts be so, if one variety of epithelium can be changed by pressure into another, and if two separate and distinct kinds co-exist on the inner surface of the same cyst, then most certainly the epithelium lining a cyst can furnish no clue to its origin, nor can different species predicate different modes of origin. An analysis of the other elements that go to make up the cystic wall furnishes no better guide, for they, too, may become so thinned from pressure that their layers are indistinguishable. With these considerations in mind, it is readily seen how futile would be the attempt to classify cysts of the vagina on a purely histological basis.

Cysts of the vagina may be roughly divided into the true and the false; into those which originate in the substance of the vaginal wall, and those which have their starting point in some one of the neighboring tissues or organs. Such an arrangement is, however, unsatisfactory, for many cysts beginning in the peri-vaginal cellular tissue, let us say, ultimately form tumors

that are distinctly vaginal. Again it has been proposed to classify cysts as mucous, interstitial, and subserous or extra-vaginal; as superficial and deep: or to distinguish those originating in a pre-existing physiological space or cavity from those which develop in a space or cavity of pathological origin.

In view of the existence of the mechanical changes but just alluded to, it will readily be seen that many of these distinctions are largely fanciful.

Many theories have been proposed to explain the origin of vaginal cysts. It is said that they develop in glands through retention and accumulation of their secretion, and this belief was formerly thought to be the only one at all tenable. But are we sure that the vagina is provided with glands? A contribution of great value, bearing upon this subject, has appeared since the publication of Winkel's treatise. We may be pardoned, perhaps, in briefly alluding to it.

In a preliminary paper in 1874, and again in a more elaborate article in 1877, Von Preuschen, of Greifswald, reviews the opinions that have been expressed in regard to the presence of glands in the vagina, and the suggestions made to account for the development of vaginal cysts. He then gives in detail, in the second of the two contributions above referred to, the results of his own elaborate investigations, made in the endeavor to settle these vexed questions. He examined in the Pathological Institute of Basel the sexual organs of thirty-six cadavera, and five cases of vaginal cysts beside. His conclusions may be briefly summarized as follows:

The vagina possesses glands, which show a structure similar to the sebaceous glands of the vulva. In many cases they occur but sparsely, but can be demonstrated in nearly all.

These glands occur in two forms, of which the first is the more common.

Form A. Moderately deep and broad depressions (crypts), with tube-like, narrow, finger-formed appendages.

Form B. Single tube-like indentations; a crypt with a single finger-like appendage.

The interior of the upper part, vaginal end, or duct of outlet, of these glandular cavities is invested with a many-layered pavement epithelium with a substratum of cylindrical cells; the deeper part or terminal extremity, with a single layer of cells of a cylindrical type furnished with cilia. This is well seen in Fig. 4 in Von Preuschen's plate. Figure 5 (Von P.) represents the lower part of a gland enlarged: note single row of ciliated columnar epithelial cells.

The epithelium investing the vaginal mucous membrane is simply continued into these glands: in the crypts all three layers are seen; the two of pavement cells lining the sac, and the cylindrical cell layer exterior to them. In the finger-formed appendices, the deep cylindrical cell layer is continued, but the pavement layers have disappeared. As soon as the cylindrical cells are freed from the pavement cells clinging to them, they become somewhat higher and appear furnished with cilia.

A membranapropria in either form of gland is only indistinctly demonstrable.

Cysts of the vagina are retention cysts, due to a retention and accumulation of secretion in these glandular cavities.

Cystic degeneration is found more frequently in form A than in form B.

Form A.—Cysts may originate, first, either in the upper part of the gland alone, cysts of the ducts of outlet, in which case they are lined by a stratified pavement epithelium. There is nothing astonishing in a retention of secretion in these broad-mouthed insinkings. Analogies are found in cystic degeneration of the crypts of the bladder and the Lieberkühn glands of the intestines, and cysts may develop in a gland whose outlet is patulous (Virchow).

Second: Cysts may begin in the lowest portion of the gland alone, in one or more of the finger-like appendages; the crypt and a few of the terminal extremities not being implicated. In this case, the lining epithelium is composed of ciliated columnar cells.

Graefe believes that if the crypts are occluded, the appendages are occluded also, or cysts are developed in each separately and finally blend. In this case the wall would be covered in part with a cylindrical, in part with a pavement epithelium, as is sometimes seen in the same cyst.

Cysts of the appendages are found much more frequently than cysts of the crypts.

The mechanism of cyst-formation in these glands, described by Von Preuschen, is in no way different from the development of retention cysts in secreting cavities elsewhere. Lebedeff, in this connection, refers to cysts of the portio vaginalis and cervical canal formed by the stoppage of glands, whose existence in these parts is unquestioned. A hyperemic, irritated, or inflamed condition of the vaginal surface not only tends to increase the amount of the glandular secretion, normally very slight, but also prevents its escape, through an increase in size or proliferation of the cells of the most superficial tissue strata about the duct of outlet, and a consequent diminution in its calibre, perhaps ending in occlusion. The abnormal impulse to cyst-formation which thus increases the quantity of secretion and prevents

its free escape, is aided by the change in the constitution of the fluid necessarily accompanying any such process. Cells lining the peripheral ends of the ducts of outlet become stripped off and form, with constituents furnished by the altered secretion, a stopper or cork, which effectually obstructs the duct terminus and prevents the escape of the gland contents. On one occasion, Von Preuschen was enabled to remove in toto such a stopper or cork from the upper part of a glandular cavity. It consisted of epithelial cells in good condition and free nuclei which, formed together into a ball, filled up the lumen of the duct. The original impulse to increased secretion and retention will in time alone, or aided by the irritation and crowding induced by cyst-formation, affect the glandular cavities in close anatomical relation to the one primarily affected, so that we see cystic degeneration of many glandular spaces present in the same circuit.

Von Preuschen's investigations as to the presence of glands in the vagina appear to have been so carefully undertaken, his results seem so trustworthy, and his theory of the origin of vaginal cysts from these glands so captivating and in such perfect accord with pathological changes in other parts of the body, with which we are thoroughly familiar, that we are easily led to agree with him in his deductions. But if it can be shown that the vagina possesses no glands, then all theories of origin for vaginal cysts depending on the presence of such structures, fall at once to the ground.

It would, in this present paper, be inappropriate, indeed impossible, to record at length the views of anatomists in regard to the presence or absence of vaginal glands, or to review the various accounts that have been given of them. Many, whose names are associated in our minds with originality of research and accuracy of description, have expressed themselves very decidedly upon this question, and investigations especially directed towards this end have repeatedly been undertaken, but there is withal the most extraordinary diversity of opinion.

Cruveilhier, Dubois, Graefe, Guérin, Heitzmann, Henle, Henning, Huguier, Huschke, Hyrtl, Jarjavy, Klebs, Krause, Ladreit, Lebedeff, Löwenstein, Luschka, Richet, Veit, and others maintain that the vagina is provided with some form of open gland or closed follicle.

On the contrary, Aeby, Collardot, Courty, Eppinger,

Eustache, Frey, Froment, Gallard, Kiwisch, Kölliker, Langer, Mandl, Näcke, Robin, Rokitansky, Ruge, Sappey, Seanzoni, Schulte, De Sinéty, Tyler Smith, Watts, and others consider the occurrence of vaginal glands doubtful, or deny their existence altogether. The investigations of Eppinger, Löwenstein, and Schulte are of more than ordinary interest.

We cannot positively affirm the existence of glands in the vagina as long as their presence is denied by trustworthy observers, and yet we are inclined to agree with those (Graefe, Lebedeff, Veit, and others) who admit that they occur, but consider them exceptional formations.

Duncan, Fritsch, Fürst, Gosselin, Hart and Barbour, Hegar and Kaltenbach, Hörder, Lebedeff, Pichancourt, Schröder, Veit, Virchow, and Winkel regard it as probable or certain that some, many, or all vaginal cysts are by nature retention cysts, developing in glands or follicles of the walls of the vagina, while De Sinéty, Schulte, and Watts consider such a theory doubtful or unfounded.

To Von Preuschen's description of the anatomical structure of cysts of glandular origin, already given, nothing need be added. A reference to illustrative cases, as, for example, that of Fürst, may prove interesting.

It is argued by Klebs that vaginal cysts, whether superficial or deep, are simply dilatations of the lymph channels which traverse the connective tissue stratum of the vaginal wall,¹ and that such cysts are invested with an endothelium akin to that which lines the lymphatic ducts. Graefe questions whether this method of origin could be made applicable to all cysts, since in such a large number we find not an endothelial investment, but a lining of a many-layered squamous, or cylindrical celled, epithelium. He further calls attention to the influence of the pressure changes, to which reference has already been made. Hegar and Kaltenbach admit that cysts may develop by lymphangiectasis, and Graefe considers that the cysts described by Klob and by Hunt were of this nature. Schulte quotes a case of his own that he believes arose from a dilated lymph-vessel under the influence of persistent inflammatory irritation.

G. Veit first suggested (1867) that certain cysts of the vagina

¹ Plexuses of lymphatic vessels are found in the mucous, submucous, muscular, and external fibrous layers of the vaginal wall; those in the last are the largest and are sacculated (Klein).

might owe their origin to the remains of the embryonal structures known as the Wolffian ducts.

The earliest description given by these ducts was by Malpighi in a letter published in 1681. Their existence was forgotten until 1822, when Gärtner discovered them anew, and since then they have been known as the canals of Gärtner. They have subsequently been studied by Jacobson (1830), Kobelt (1847), Follin (1850), G. Veit (1867), Von Preuschen (1877), Beigel (1878), Freund (1878), Kölliker (1879), Graefe and J. Veit (1882), Kocks (1883), Böhm (1883), Dohrn (1883), Geigel (1883), and by Rieder and others.

Rieder, in an elaborate and exhaustive paper (1884), reviews the work of all the observers so far quoted, and appends the results of a most valuable series of investigations, conducted by himself in the Pathological Institute of Basel.

The fact of the persistence of these ducts in certain animals, notably the cow, sow, cat, fox, sheep, and mare, has been demonstrated beyond question. Their presence in man has been doubted, even denied (Coblenz), and as late as 1881, Watts said he had looked in vain for a detailed description of them. In view of these circumstances, and the fact that the cyst in our own case arose, in all probability, in a dilated duct of Gärtner, we are led, in order to make our studies more intelligent, to refer briefly to the anatomical structure of these embryonal remains.

The sexual organs of 40 female subjects of different ages (from an embryo 13 cm. long to a woman of 67 years) were investigated by Rieder. He reaches the following conclusions.

Remains of Gärtner's ducts are found in the human female in about every third case, and may persist up to a considerable age (67 years). They are present in one of two forms: *a.* an epithelial tube surrounded by muscle (in one-fifth of the cases); *b.* a muscle bundle without epithelium (in one-sixth of the cases).

They are more commonly encountered on the right than on the left side. At first they rest upon the border of the lower segment of the uterine body. Opposite the point of junction of body and cervix, they pierce and imbed themselves in the musculature of the uterus, lying at the side and somewhat in front of the lumen of that organ, which they approach very closely in the lower part of the cervix. They abruptly leave the neighborhood of the cervical canal in their transition to the vagina. In the vagina they lie antero-laterally in its muscular coat, at first pretty near the mucous membrane, but lower down, in the midst of the muscularis, somewhat removed from the mucosa, and yet distant from the urethra. Below the mid-urethral level it is not possible

to follow them, nor can one discover any terminal openings. The atrophy and disappearance of this segment of the canals is due to the attenuation during growth of the urethro-vaginal septum.

[Some authors do, however, describe two small indentations, called Skene's tubes, situated near the external orifice of the urethra, and consider them the peripheral extremities of the ducts of Gärtner, although it is admitted that the connection between the canals above and these tubules below may be disturbed. This opinion has been challenged, and, so far as we are aware, the continuity between the two, in man at least, has not been established. Rieder does not discuss this question, but it may be interesting to refer to the work of Kocks quoted by him, and also to the articles of Skene (1880), Coblenz (1881), Schüller (1882), Kleinwächter (1883), Obedieck (1884), Schröder (1886), and Sutton (1886).]

Rieder continues: In shape the canals in the vagina appear as simple crevices or slits in the substance of the wall, with here and there a notch or indentation in them. As they descend, these interruptions become more frequent, the ducts grow narrower, lose their lumen, and show finally, before they disappear, only as epithelial stripes or streaks. The canals are invested internally with a double layer (exceptionally a single layer) of cylindrical cells of medium height and without cilia. The epithelium clings loosely to its connective-tissue environment, from which it is frequently found detached, either in irregular groups of cells or as a connected tube.

Rieder asserts, further, that the epithelium lining the duct is surrounded by a thin connective-tissue stratum—the mucosa of the canal—and this by a muscular envelope, consisting of three layers of smooth muscle fibres, the outer and inner arranged longitudinally, the middle circularly. The muscular coat is slightly developed in the portion of the duct traversing the vagina. In the solid muscle bundles above described, the layers may be separated from each other, and are interwoven with connective-tissue fibres.¹

That from these ducts of Gärtner a form of vaginal cyst can develop, as suggested by Veit, is not improbable—indeed it is quite generally admitted—for beside Rieder, whom we have

¹ In its upper portion the duct of Gärtner corresponds to the vas deferens; in the region of the cervix, with the seminal vesicles; and in its course through the vaginal wall, where its cross section appears crevice formed, to the ejaculatory duct in man. Sutton thinks a diverticulum, seen just before the termination of the duct in the vagina, is the homologue of the seminal vesicles, while Watts says that these ducts correspond with the peritoneal tubes seen in crocodiles and described by Milne Edwards.

For diagrams of microscopical cross sections of Gärtner's ducts see Von Preuschen.

just quoted, many well-known writers upon this topic, Froment, Graefe, Hegar and Kaltenbach, Höning, Schulte, and others entertain a like opinion.

Duncan, however, maintains, quite authoritatively, that there is not a single case known in which an accumulation of fluid has been proved to be situated in a dilated duct of Gärtner, while Kaltenbach and De Sinéty, although admitting that such a theory of origin for vaginal cysts is not illogical, yet with perfect justice, as it seems to us, call attention to the great want of anatomical demonstration.

Some authors (Mundé, De Sinéty, Winckel) assert that, since cysts are situated so rarely upon the side wall or in the lateral portion of the vagina, Veit's theory can hardly be considered of any great value. Von Preuschen comes to the same conclusion because, as he believes, cysts are seated most often upon the posterior or lateral walls of this conduit. Of course no one undertakes to say that this idea of Veit's is applicable in determining the origin of all vaginal cysts, but still such arguments as those we have just rehearsed are apt to lead one astray. A great deal of confusion may be avoided, and one's ideas be made much clearer, by remembering that, although the anterior and posterior walls are affected by this species of cystic disease with an almost equal degree of frequency, and much oftener than the lateral walls, yet it is rare to find a cyst occupying any one of these positions to the exclusion of all others. As has been already mentioned, cysts of one wall, particularly if large, overlap and encroach upon another.

Further, we must remember that the canals of Gärtner lie antero-laterally in the vagina, towards its side, yet in the substance of the anterior wall.

In regard to the mechanism of the development of cysts of the vagina from the ducts of Gärtner, Von Preuschen emphasizes the importance of the plugs of epithelial débris which are sometimes found almost filling up the lumen of the duct, and also the variations in the calibre of the tube, the deviations at its point of exit, or even the complete want of any terminal opening. All of these conditions favor obstruction and dilatation.

As has been said before, there is but little anatomical proof in support of Veit's theory. Yet Sutton describes and pictures two cysts the size of hen's eggs in the vagina of a cow, which

clearly owed their origin to a dilatation of a Gartner's canal, *Fig. 4.* and he observes that smaller enlargements of this kind are of frequent occurrence. Besides, interesting cases of cysts of the vagina in women are recorded at length by Rieder, Warren, and Watts (the specimen in the last having been examined and described by Garrigues), in which a like mode of development is, we believe, proven beyond question.

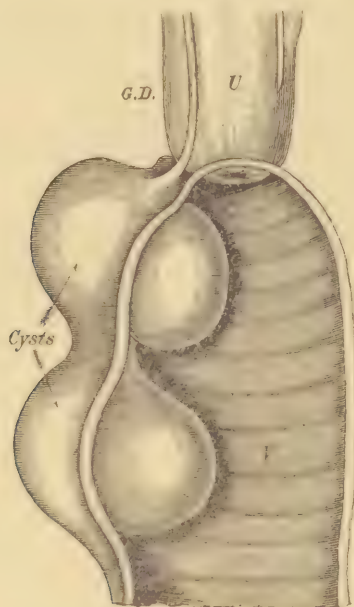


FIG. 4. (After Sutton.)

The present seems to us the most fitting opportunity for the introduction of the history of our own case.

On the 19th of April, 1886, Mary M., æt. 30; married; a slender, delicate, mulatto woman, presented herself at the Woman's Clinic of the Central Dispensary with the following history :

Menstruation began in her 14th year, occurs every thirty days, and lasts three days. The quantity is profuse, and there is pain during the flow, of a cramp-like character, in abdomen, back, and hips.

In the intermenstrual period there is profuse leucorrhea, pain in the back and left inguinal region.

Dyspareunia.

An abortion, probably at the third or fourth month, occurred eight years ago, accompanied by severe hemorrhage.

One child at term, two years and four months ago ; labor was difficult and tedious, but terminated without artificial assistance ; convalescence was rapid and the patient nursed her child.

Bowels always regular. Difficult urination, with retention at intervals, for the last two months.

The patient came to be treated for leucorrhœa and pain. She was very ignorant, and it was only after repeated questioning that it could be established with any degree of certainty that she had always been well before, but never since the birth of her child. She had never noticed any tumor about the genitalia.

Present Condition.—Laceration of the perineum ; slight cystocele and rectocele ; laceration of the cervix ; subinvolution and slight prolapsus of the uterus. The vaginal walls were inflamed and covered with a muco-purulent secretion.

There were four considerable elevations above the vaginal surface, lying one below the other in a straight line, on the right half of the anterior wall, which, for convenience of description, have been numbered from above downward 1, 2, 3, 4. The uppermost ^{was} situated just below the level of the cervico-vaginal junction ; the lowest immediately behind the meatus urinarius.

They all presented as regular hemispherical projections, sharply bounded and separated from each other by a slight interspace, except the lowermost, the long diameter of which was parallel with the long axis of the body, and its shape not unlike that of a lima bean. They rapidly decreased in size from above downward ; the uppermost tumor, No. 1, being about the size of a large plum, while the last, No. 4, was hardly as large as a lima bean. The whole arrangement looked not unlike a string of four beads of different sizes.

The surface of the two intermediate tumors was bluish-white in color, smooth and glossy ; that of the others appeared covered by the normally wrinkled but inflamed and thickened vaginal mucous membrane.

They were all tense and elastic, Nos. 1 and 4 offering more resistance to pressure than did the other two, while in no case was there sensitiveness or pain.

Constant pressure produced no change in the shape or position of the tumors, and exploration of the urethra and bladder with a sound, showed no connection with them.

A diagnosis of multiple cysts of the anterior vaginal wall was made. A portion of the fluid on this or a subsequent occasion was removed from each of the cysts by a hypodermic syringe, and examined chemically and microscopically.

The contents of cysts Nos. 2 and 3 exhibited the same characteristics—a clear, straw-colored, slightly tenacious fluid of a neutral reaction, and containing about one-tenth its bulk of albumin. On microscopical examination were found a few red blood-corpuscles ; large round granular cells, like the so-called ovarian corpuscles, and affected in a like manner by acetic acid ; and

finally, squamous epithelial cells in abundance, but smaller than the superficial vaginal epithelial cells from the same case.

Cyst 4 contained a colorless, jelly-like, colloid mass, which did not escape on puncture, but was expressed from the cyst. It presented a microscopical picture identical with that of cysts 2 and 3.

The fluid removed from cyst No. 1, the topmost, was, however, markedly different from the other three specimens. It was of a dark, reddish-brown color, turbid and viscid, of a strongly acid reaction, and contained one-fifth its bulk of albumin. On standing, there appeared a clear yellowish stratum above, and a dark-brownish one below.

There were found an abundance of red blood-corpuscles and large round granular cells; also a few leucocytes and squamous epithelial cells. There was much granular débris.

In no case had the fluid any odor, nor were oil globules nor cholesterin crystals observed.

It was with some difficulty that the hypodermic needle could be made to enter cysts 1 and 4, the wall in each instance being tough and unyielding, but cysts 2 and 3 were easily pierced.

Cyst No. 4, the smallest, did not refill after puncture, while in cyst No. 3 there was a return of fluid, and in twenty days it was as large and tense as before. The contents, again withdrawn, showed no change in chemical or microscopical constitution.

Cyst No. 2 completely refilled in ten days. The sac was a second time evacuated through a hypodermic needle. The yellowish-brown purulent looking liquid had a marked acid reaction and a slight disagreeable odor. It contained pus-corpuscles in large numbers, oil globules, granular squamous epithelial cells, and the large round granular cells previously noted.

In thirty-eight days from the time that cyst No. 1 was emptied, it had regained its former size; its contents, again examined, showed characteristics identical with those previously observed.

To summarize, therefore: cyst No. 4 disappeared after the first tapping, while there was re-accumulation of fluid in cysts 1, 2, and 3.

Immediately after the second puncture in each of the three latter instances, an operation was performed for the cure of the affection, the hypodermic syringe having been used simply to withdraw, for purposes of investigation, as large a portion of the contents of the cysts as possible. It is not at all surprising that simple puncture did not produce a radical result; the return of fluid occurred, however, much more rapidly than one would have expected. It is probable that in no case was the cyst completely emptied, and that the mechanical irritation incident to puncture, even with a very delicate needle, was enough to hasten the reproduction of liquid in all cases, and the occurrence of inflammation in one.

The entire length of the anterior wall of cyst No. 3 was incised in the direction of the long axis of the body. Without further

treatment, the depression, lined by a smooth and silvery membrane, soon became indistinguishable among the wrinkles of the vaginal superficies.

The surface of cyst No. 2 was cleansed and dried, and pencilled with a four-per-cent solution of cocaine. It was then incised as in the previous instance, an elliptical piece removed with scissors from its anterior wall; its cavity, lined with a pyo-

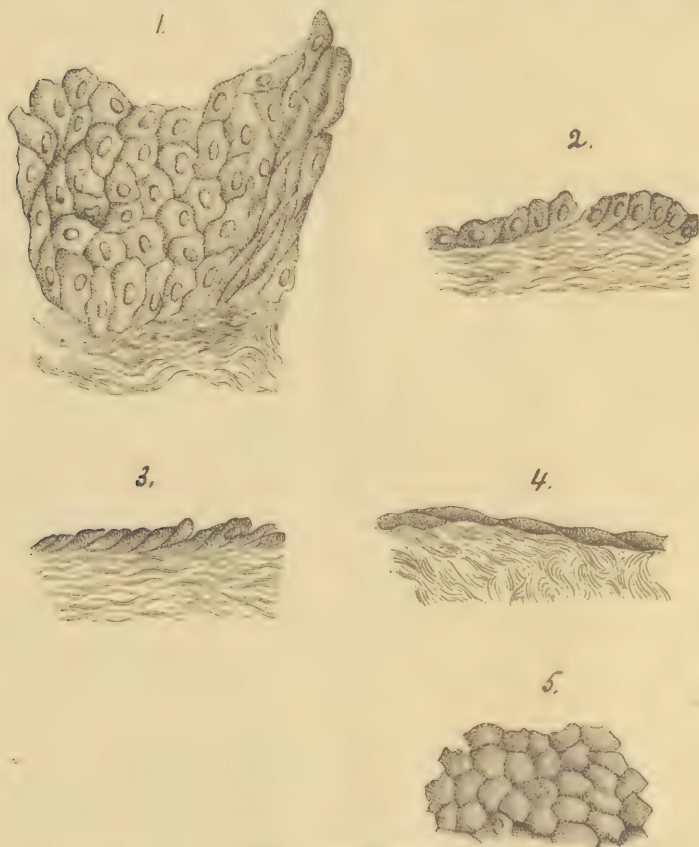


FIG. 5. (After Lebedeff.)

genic membrane, was washed out with an antiseptic solution, and packed with iodoform gauze. This dressing was repeated many times. The cyst slowly granulated up from the bottom, and there was ultimately left of it nothing but a small depressed cicatrix in the anterior vaginal wall.

Cyst No. 1, the largest, was subjected to the same plan of treatment. As was feared, on account of the small size of the elliptical piece removed from the anterior wall of the sac, it

showed a tendency to close. Therefore, nearly all that portion of the cyst-wall projecting above the vaginal level was removed with scissors, after the parts had been thoroughly anesthetized with a twenty-per-cent cocaine solution, and the membrane lining the cyst cavity was stitched to the vaginal mucous membrane by ten catgut sutures. The unremoved portion of the sac was thus turned into the vagina, which was packed lightly with iodoform gauze. The edges united without suppuration, and in a very short time a small, shallow depression alone marked the former seat of the cyst.

A microscopical examination was made of the elliptical piece removed from the wall of cyst No. 3. It was found to be composed of connective tissue and unstriped muscular fibre. The internal investment consisted largely of a single layer of columnar epithelial cells without cilia. The cells were arranged, in part, at a right angle, in part in a direction oblique to the subjacent tissue. In places, this obliquity was accentuated, and the cells presented the appearance of slightly overlapping pavement cells, viewed in profile. Occasionally, a distinctly marked, many-layered pavement-cell stratum was to be seen. In other words, there could be noted here the same transitional phenomena which have already been alluded to, and which Lebedeff has so lengthily described, in illustrating the changes wrought by the pressure of the contents upon the lining epithelium of vaginal cysts. Indeed, it would be impossible to represent more accurately than do Lebedeff's diagrams the appearance of the sections made in our own case by the microscopist of the Army Medical Museum, Dr. W. M. Gray.

Fig. 5.

We believe that the cysts in this, our own case, originated in a dilatation of the vaginal portion of the right Gärtner's canal.

It has been intimated by Freund that vaginal cysts might be due to an accumulation of fluid in a duct of Müller which, during development, had failed to unite with its fellow of the opposite side; and Graefe considers this theory not improbable, since the remains of embryonal double formations of the genital canal are encountered with a relative degree of frequency.

Duncan, Fritsch, Hart and Barbour, Hegar and Kaltenbach, Mundé, and Veit speak rather favorably of the idea, while Winckel considers that there is only one other mode of origin possible for cysts which are deep-seated and provided with muscular walls. Breisky thinks that Winckel's case of congenital cyst was of this nature.

The walls of such tumors would be of a structure similar to that of the vagina itself; the inner epithelium remaining cylin-

drical in type, or showing an alteration to the pavement variety.

Graefe considers that the cysts in his third case were due to a manifold constriction of a non-united Müller's duct; and in his ninth case, that two cysts developed in Gärtner's and one in Müller's duct—a combination strange, he thinks, but not impossible.

The theory, especially advocated by Froment, that a cyst of the vagina is simply the result of an accumulation of fluid in a depression formed by the union of the crests of two contiguous folds of the vaginal mucous membrane, is questioned by Klebs and Kolaczek.

Froment's ideas may be summarized as follows: Depressions exist between the ridges into which the mucosa of the vagina is thrown; these are particularly marked in women who have not had sexual intercourse, and have never borne children. Two neighboring folds, under the influence of some irritative or inflammatory stimulus, adhere to a certain degree by their free borders, and thus a little cavity is formed between them. In this cavity, lined by the usual vaginal epithelium, there accumulate little by little the products of secretion, abnormally increased, perhaps, by the inflammation which produced the sac, until a retention cyst is formed which ultimately develops into a tumor of appreciable size.

It is true that in some cases a cyst is found with an epithelial investment that would seem to make this mode of origin possible, yet we are not inclined, without further anatomical proof, to attach any great importance to this theory so ably advocated by Froment.¹

At the beginning of this recapitulation of the various theories of origin that have been proposed for cysts of the vagina, certain general divisions or classes were mentioned, under one or the other of which authors have endeavored to arrange all such morbid growths.

As our studies have progressed, it has become apparent, no doubt, how difficult it is to trace back each cyst, no matter how carefully it is investigated, to its true starting-point. We have an almost identical structure in cysts of different kinds, and in cysts of the same kind, unlike constituent elements; further,

¹ Cf. Collardot, Englisch, Von Preuschen, Winckel, and especially Eppinger in the discussion of emphysema of the vagina.

we have noticed a general resemblance in the mode of formation and in the subsequent history of all such tumors wherever they began.

Between no two species of vaginal cystic enlargements is it so difficult to draw the line as between those which we now approach, called respectively interstitial and peri-vaginal cysts. In the causation of each, the same etiological factors are at work, the starting-point is in the same kind of tissue, the method of formation is the same, and the structural elements identical. It is true that, theoretically, we would find in the wall of the cysts originating outside of the vagina certain tissues undiscoverable in the interstitial variety; but practically such is not the case. We rarely see these cysts in the beginning of their history, but only after they have grown large enough to attract the attention of the patient; their original structure is then found altered by pressure from within and from without.

Beneath the mucosa of the vagina there lies a submucous layer of loose connective tissue, while outside of the vaginal wall proper there is an environment of fibrous tissue, interwoven here and there with bundles of unstriped muscle fibre. In each of these areas open spaces of appreciable size are to be found, and in each there is a venous plexus, that without being the larger. The physiological changes of pregnancy, the influence of indiscreet or excessive sexual intercourse, the effect of difficult or repeated labors, and many other things beside, produce an enlargement and fusion of these tissue vacuoles with an outpouring and accumulation of fluid therein—a pathological process of which we find the similitude in the formation of bursæ elsewhere. Or, again, there may be an extravasation of blood into the meshes of the submucous or peri-vaginal tissue during pregnancy or labor, although, as has been shown, it may occur independently of these, or, indeed, of any local affection or direct injury.¹ In either case the same changes take place in these fluid accumulations as occur under like conditions in other parts of the body. The contained liquid undergoes certain retrograde alterations, and induces by the irritation of its pres-

¹ Barnes, Froment. Murray narrates the following case: Female gymnast, æt. 17, fell a distance of ten yards, alighting on her feet. A hematoma appeared on anterior vaginal wall; eight ounces of dark uncoagulated blood drawn off by aspirator.

ence a condensation of the surrounding tissues and the formation of a proper capsule. This latter acquires an inner cellular investment of true or false epithelium or endothelium, as it has been variously termed. In certain cases, presumably when these processes take place rapidly, there is to be found neither distinct encapsulation nor cellular lining of the fluid cavity.

Winckel thinks that the largest number of his fifty cases were cysts of the interstitial variety (believing that they may develop in the muscularis as well as the submucosa), since they were of large size, had thick walls, were distinct from the vaginal mucous membrane, which, in many instances, was freely movable over them, and because, in sixty-six per cent of the total number, the tumors were situated in the lower half of the vagina, where, as he avers, even those who maintain that glands exist, have failed to discover them. He also considers that some cysts originate in the peri-vaginal area.

Other authors, among whom may be mentioned Barnes, Breisky, Courty, Froment, Hegar and Kaltenbach, Thalinger, Warren, and Watts, agree that cysts may develop, as has been described, in the cellular tissue beneath the mucosa or surrounding the vagina. But there are certain writers, Eustache, Förster, Levrat, Rokitansky, and Scanzoni, who go further than this, and maintain that the so-called cysts of the vagina, almost without exception, have their starting-point in the peri-vaginal tissue, and are quite independent of the vaginal wall. Kolaczek, while admitting that circumscribed fluid accumulations may primarily be seated around the vagina, views a dehiscence of the vaginal wall as of doubtful import. Finally, Froment argues that the occurrence of multiple cystomata speaks against an hygromatous origin.

Cases are recorded by Barnes, Beaver, Bradfield, Collardot, Dupuy, Eustache, Gotthardt, Graefe, Hunt, Lee, Mundé, Simpson, and Tillaux, in which a submucous or peri-vaginal origin was considered probable or certain. It may be of interest, from an etiological standpoint, to note that among these patients (13 in number), 7 were said to have borne one or more children; 1 was single; 3 had had sexual intercourse; while 1 was, in all probability, a virgin.

Among those who have written upon the subject of vaginal cysts, Duncan and Gosselin refer to tumors, said to be of this nature, but which are in reality mere hernia-like sacs filled with

peritoneal fluid. These at first communicate freely with the cavity of the peritoneum, but, as the result of inflammatory adhesion, become completely shut off, project into the vagina, and may even approach the vulva. A case of "vaginal blood cyst, protrusion through vulva, evacuation, recovery," reported by Cullingworth, seems to be an example of the above condition; it has not been included in our list of vaginal cysts.

A consideration of cysts of the urethra would appear to be beyond the province of the present paper, and yet reference must be made to them, since it has been remarked that many so-called cysts of the vagina are of urethral origin.

Englisch has made a special study of this subject. He found near the meatus in new-born girls one or more small eminences, retention cysts, resulting from the obstruction of lacunæ or mucous glands of the urethra. If numerous, they remain small; when alone, they reach a larger size. Such a cyst may rupture spontaneously and leave only a slight depression to mark its former seat, or it may expand in the direction which offers least resistance to its growth. Cysts arising in a lacuna, gland, or diverticulum of the female urethra, especially of its floor, present as fluid tumors of the urethro-vaginal septum. Some vaginal cysts at this point may be thus developed.

Among those whom we have already quoted, Hegar and Kaltenbach and Warren express themselves in favor of this latter assumption. Duncan says that sometimes a urethrocele is almost a cyst, there being only a minute communication with the urethra; and Breisky believes that deep-seated and large-sized cysts of the urethro-vaginal septum may possibly originate in a partial dilatation of the urethra, the connection between the diverticulum and this canal first contracting, and finally closing. This, he thinks, needs anatomical demonstration. He refers to Winckel's well-known treatise upon "Diseases of the Urethra and Bladder."

Vaginal cysts of supposed urethral origin are described by Breisky, Hickinbotham, Kolaczek, and Von Preuschen. The inner aspect of the cyst in Kolaczek's case, the only one in which a microscopical examination was made, was found to be invested with a stratified pavement epithelium, strikingly like that which lines the inner surface of the urethra, particularly that part near the meatus. Reference may also be made to Layton's case, details of which are given further on.

Of the many kinds of vaginal cysts, and the probable ways in which the fluid accumulation may begin, a few remain to be mentioned.

De Sinéty and Eustache believe that some of these tumors may be of mucous origin—myxomata—and Bradfield speaks of solid fibrous bodies which pass by inflammatory change into a fluid state. Barnes comments on the resemblance between certain of these vaginal growths and fibro-cystic tumors of the uterus, in which the cystic element is especially developed.

Warren and Watts agree that there may be dermoid cysts of the vagina which, Breisky says, arise in the connective tissue outside the peritoneum.

Veit's case: fluid in cyst corresponded with that found in dermoid tumors, yet hair and teeth wanting.

There are two cases of supposed hydatid cyst of the vagina recorded respectively by Burke and Hutchinson.

Contents of Cysts of the Vagina.

Considering the many different sources from which cysts of the vagina may be derived, we are prepared to find great variations in the quantity and quality of the contained fluid. The quantity will of course depend upon the size of the tumor; in most reported cases, only approximate measurements have been made.

It may, we believe, be properly asked if anything is to be learned from an examination of the liquid removed from vaginal cysts. The older observers, as Von Preuschen has pointed out, investigated the contents of these cysts with great care, in the hope of finding something peculiar and characteristic, by means of which their origin could be determined. We know how futile any such attempt is likely to prove.

From our knowledge of this species of morbid growth in other parts of the body, we can at once appreciate what great changes the contents of vaginal cysts would suffer from alterations, chiefly of an inflammatory nature, taking place within the sac, and we may at once assume, therefore, that with the exception of the essential elements of dermoid or hydatid collections, nothing significant of their nature is likely to be found. Indeed, Graefe has shown that the contents of cysts of the same construction may be different, and of dissimilar cysts the same.

A study of the anatomical constituents of the walls of cysts throws but little light upon the etiology of such tumors; an examination of the contained fluid still less; and it is for this reason that we omit entirely any details concerning the contents of vaginal cysts.¹ To one case only will we refer: a unique case described by Layton, in which a calculus was found, that had, in all probability, originated in a cyst of the vagina.

Patient, æt. 49, with cancer of cervix uteri. On anterior vaginal wall an ulcerated projection or teat of tissue, the size of a bean. A hard mobile mass, on which finger-nails grated, seemed to be working its way through it from direction of bladder. It projected about one-quarter of an inch. Could not be enucleated with the finger. A few days after examination, while urinating, the mass dropped into vessel: no dribbling of urine thereafter. Proved to be a stone, ovoid; one inch long, $\frac{68}{100}$ of an inch in diameter; weight 76 grains; dark colored; without odor; consisted of phosphate of lime, like prostatic and salivary calculi.

Layton thinks this calculus originated in cyst of vaginal wall, possibly due to ossification or calcification of cheesy or dermoid contents. It certainly did not originate primarily in the bladder, for there were no vesical symptoms before, at the time of, or after its discharge, nor could any communication between bladder and vagina be discovered. It was evidently not a foreign body introduced from without which had become encysted. Further than this, the precipitation and crystallization of the inorganic constituents of the fluid in a vaginal cyst would involve no process unlike those which we are accustomed to encounter in cysts elsewhere, nor would the resulting calculus be different. No other instance of this kind has been observed.

We have accepted Layton's interpretation of this case, as we have done that of other authors in regard to the cysts described severally by them. It should not be forgotten, however, that Bourdillat, in his excellent thesis upon "*Calculi of the Urethra and its Neighborhood*," mentions cases observed by Ford, Secieux, Roberts, and Civiale, in which calculi were found in the vaginal wall, near the urethra, and a similar case is recorded by Gibbs, yet in none of them were cysts present.

Schmidt, who examined the stone in Layton's case, considers

¹ For a discussion of this topic see Breisky, Collardot, Dentu, Froment, Graefe, Hegar and Kaltenbach, Klebs, Schulte, Thalinger, Veit, and Winckel.

“ that the entire mass is the remains of a racemose gland of the vagina, in the acini of which the inorganic matter was deposited. The specimen examined appears to consist of a number of laminated round bodies, each inclosing a nucleus composed of small round elements, which seem to be the remains of glandular epithelial cells.”

3. ETIOLOGY.

There is, of course, no hereditary nor constitutional tendency, no past nor present affection of the general system, that can be considered as a predisposing or exciting cause of vaginal cysts. In 52 instances in which the age of patients has been noted, 17 were between 20 and 30, 13 between 30 and 40, 12 between 40 and 50, 5 between 10 and 20, 2 between 50 and 60, 2 between 60 and 70, and 1 before 10 years of age. Those physiological changes, diseases, or injuries which directly alter the integrity of the structure of the vaginal wall, or of the tissue immediately surrounding it, can alone be denominated causative agents. We do not refer, of course, in this connection, to cysts which owe their origin to some congenital defect (cases of Breisky and Winckel). Whatever induces a hyperemic, an irritated, or an inflamed condition of the mucous membrane of the vagina on the one hand; or, on the other, through continued friction, crowding, or stretching, causes relaxation with enlargement of tissue spaces in its deeper strata, or in its connective-tissue environment, with an effusion of blood or serum, will set on foot those pathological conditions most necessary to the development of vaginal cysts. We would expect to find cysts of the vagina, therefore, oftenest in those who have been habituated to too early, indiscriminate, or excessive sexual intercourse, in pregnant women, or in such as have borne many children, and in whom labor has been difficult or prolonged; or, finally, in those who have sustained local injuries, independent of coitus or childbirth.

Eustache, Kiwisch, and Thalinger call attention to the fact that prostitutes are particularly predisposed to this form of vaginal growth, and it has been said that cysts are usually seated on the anterior wall, under the symphysis pubis, where friction, during intercourse, is greatest. Courty, indeed, describes bursæ, seen in prostitutes, situated on opposite sides of the vaginal canal, to which the name “ bursæ professionnelles ”

has been given. 5 of Winckel's 50 cases were probably public women; while among the 112 added by ourselves, 3 were confessedly prostitutes. How many more were addicted to too early, indiscriminate, or excessive sexual intercourse, it is impossible to say.

Winckel comments upon the effect of pregnancy and labor in the causation of cysts of the vagina. He remarks that, in 12 of 13 cases observed by Huguier, these tumors had originated after pregnancy or labor. Eustache says that 11 of 30 cases collected by Huguier had been delivered, and that the cysts had appeared during utero-gestation or after confinement. In Winckel's own cases (50), 8 had borne one or more children, while 8 per cent of cysts were due neither to pregnancy nor accouchement.

In 62 of 112 cases which we have collected, 2 were virgins, 3 unmarried women. One single woman and 2 not specified as married had had sexual intercourse, but had not conceived. There were 37 married women, of whom 1 had never borne children. 43 women had been delivered one or more times; 35 had 101 children; 3 were said to have been multiparæ; 4 women had aborted. In 24 instances the cyst was discovered at some time during the period of utero-gestation or at the moment of confinement.

In a few cases, the character of the labor preceding the discovery of the cyst is described, but we fail to acquire any information thereby.

Other definite etiological features are mentioned by Eustache, namely, enormous size of the male sexual organ, and the irritation produced by a prolapsed uterus. He describes a case in which a cyst was supposed to be due to an injury done to the vaginal wall by a syringe, and another, to a blow on the perineum.

Such a length of time may elapse between the activity of the real causative factor and the recognition of the tumor that it is impossible to say when or why cystic formation began. The co-existence of other pathological conditions predicates no causal relation whatever.

In conclusion, if we may be permitted to judge from our own limited experience, the etiological influences above enumerated do not seem to be so very potent.

Since this paper was begun, we have examined carefully and repeatedly in the Woman's Clinic of the Central Dis-

pensary 500 patients, who had either borne children, were addicted to early, promiscuous, or excessive sexual intercourse, or were notoriously prostitutes, and often all three conditions were present in the same individual. A very large proportion of this number were suffering from some form, either direct or remote, of venereal infection, while nearly every variety and grade of traumatism and inflammatory change which can be met with in the female genitalia here found an illustration.

We have not been able, so far, to add one case to that upon which this paper is founded.

4. SYMPTOMATOLOGY.

Cysts of the vagina are, as a rule, of no great clinical importance. Unless they are large, the patient may remain entirely ignorant of their existence, and discovery is purely accidental. Indeed, even when she is cognizant of their presence, they may give rise to so little disturbance that operative interference is deemed unnecessary, or, if proposed, is declined. Eustachie cites the case of a prostitute with this affection who, in spite of her manner of life, was so little incommoded that she desired no operation.

As vaginal cysts are tumors of slow growth, the disturbances of sensation and of function which they cause are slight at first and become manifest but slowly.

It is often said that the symptoms which led to an examination and the discovery of the cyst began at this or that time, before or after a certain childbirth. Yet if we examine carefully into each case, we will find that the symptoms in question are evidences of some other disease or some injury of the genitalia, and that they are of a character to mask any disturbances that the cyst, of itself, could call forth. The growth is, in such cases, a co-incident, but not the all important pathological condition.¹ Indeed, if all the subjective symptoms attendant upon cysts of the vagina are present in typical array, they are so little characteristic that they indicate solely the existence of some, it may be, purely functional, affection of the female sexual apparatus.

The subjective symptoms which result more or less directly

¹ Kaltenbach's case, in which there was a lacerated cervix, enlarged and retroverted uterus, prolapse of the posterior vaginal wall, etc. K. says the principal suffering of patient was due to size and dislocation of uterus, and stretching of broad ligaments.

Layton's case, with symptoms of carcinoma of cervix uteri.

The author's case.

from the presence of vaginal cyst may be classified as follows: 1st. Sensations of pain and tenderness in the tumor, commonly present only in cases of irritated or inflamed cyst; and 2d. Interferences with function, of a mechanical nature, dependent on pressure and traction.

In 9 cases, from among those collected by ourselves, there was neither pain nor tenderness in the tumor. In Gosselin's case there was pain, but the cyst was said to have been more of an incommodity than a cause of suffering. In Tillaux's case, in which the growth was carried twenty-two years, it became painful only after inflammation had occurred. In Dentu's case, there was no pain, in spite of inflammation and suppuration of the sac. In several instances, a feeling of fulness, weight, tensity, or pressure in the vagina or region of the perineum was observed; while in others, vague pains and morbid sensations in the hypogastrium, thighs, etc., not in all cases directly ascribable to the tumor, were present. If the cyst is large or prolapsed, there may be, besides, symptoms such as those which accompany an enlarged or prolapsed uterine body—bearing-down pains, dragging, and the sensation of the descent and escape of something from the vagina.

Cysts often act as foreign bodies in the vagina and produce an irritated and inflamed condition of the mucous membrane, or aggravate and maintain such a state if already present. Thus a leucorrhœal discharge is said frequently to accompany this affection.¹

Cysts may interfere with the function of micturition, of defecation, and of menstruation, although the effect upon the last may be considered somewhat questionable. Urination may become frequent, painful, difficult, or impossible; or there may be vesical tenesmus. In 9 cases, symptoms referable to the urethra or bladder are to be observed. It is noteworthy that, among them, the cyst was situated on the anterior vaginal wall 5 times; on the posterior, twice; on the lateral, once; while in one instance two cysts were present, one on the anterior, the other on the posterior wall of the vagina. In two cases of cyst of the anterior wall, in another where the posterior wall was affected, and in two where the seat of the tumor was on the lateral wall, it is remarked that micturition was not interfered with.

¹ Nücke observed no fluor albus in six cases of vaginal cysts in pregnant women.

In one instance of cyst of the posterior, and in one of cyst of the anterior vaginal wall, defecation is said to have been difficult ; while in one of the posterior, and another of the lateral wall, no trouble of this kind was experienced.

Cases are recorded in which, during the development of the cyst, menstruation became, in one, too frequent and profuse ; in another, prolonged and painful ; and again, in a third, disturbed. In one instance, the obstruction furnished to the escape of the menstrual discharge from the vagina by two tumors, one on the anterior, the other on the posterior wall, was said to have been the cause of the dysmenorrhea from which the patient suffered.

All of these functional derangements to which we have alluded are accentuated—indeed, in some instances, are only manifest—when the cyst is large : during the general pelvic congestion accompanying the menstrual epoch ; after standing, walking, or other exercise ; or, finally, when the cyst becomes prolapsed, or, from this or other causes, protrudes through or beyond the vulvar fissure. Then, locomotion and rest in the sitting posture are alike unpleasant or impracticable, and we are told that in one case the woman had to restore the tumor to the vagina with the finger before she was able to work.

As would be supposed, cysts of the vagina afford more or less of an impediment to coitus, so that the sexual act is often made difficult, painful, or impossible. This is noted in 10 cases, in which the cyst was seated on the anterior wall of the vagina 5 times ; on the posterior, 4 times ; while in one, a tumor was present on both the anterior and the posterior wall. In three instances, in all of which the cyst was situated on the posterior wall of the vagina, sexual intercourse was undisturbed. In the case of the prostitute reported by Eustache, the tumor, in all probability, was easily elevated on the introduction of the male sexual organ.

We know that vaginal cysts are not commonly regarded as causes of sterility—of our own cases more than one-fourth were pregnant women—and we are distinctly told that conception has occurred in one instance twice, and in another four times, after the presence of a cyst in the vagina had been determined. Yet Grynfeldt records a case in which a cyst filled up the posterior cul-de-sac of the vagina, and produced an aggravated condition of uterine anteversion. The woman was sterile, and he, unable to find any other cause, evacuated the

cyst with the happiest results; the uterus returned to its normal position, and fecundation occurred a short time thereafter.

It happens now and then that occasions arise which make one doubt the correctness of the words that preface these brief remarks upon the symptomatology of cysts of the vagina. Such tumors are occasionally of considerable clinical importance. Among our own cases, labor was complicated by their presence twenty-one times.¹ In many, excluding those in which the cyst was evacuated before labor began, delivery was unimpeded, either on account of the small size of the growth, or because of its being soft, yielding, or movable, or when rupture and emptying of the sac resulted from the pressure of the descending fetal extremity.²

But such a fortunate termination to utero-gestation is not invariably to be anticipated. Labor may be prolonged, and indeed, may become difficult or even impossible until the cystic sac is punctured or incised, its contents evacuated, and the obstruction to the passage of the child is thus removed.³

In ten of these twenty-one cases, a cyst of the vagina produced an abnormal labor.

5. DIAGNOSIS.

Under ordinary circumstances, the recognition of cysts of the vagina is easy.

Women who suffer from this malady not infrequently imagine that they have a descent of the womb; the presence of an unusual enlargement in the vagina, at the vulva, or between the thighs creating this belief. Occasionally, at the first glance, the swelling of the vaginal wall suggests to the mind of the examining physician a cystocele, urethrocele or rectocele; and indeed the resemblance is often very striking. On careful inspection, however, the mucosa covering a cyst is found to be smooth and shining, while in the other conditions it is thickened and wrinkled. Digital examination of the vagina and rectum, and the employment of the bimanual method, will do much to clear up the diagnosis. In many in-

¹ Cases of Bidder and Wassily, Burke, Dupuy, Fürst, Hickinbotham, Ingleby, Lee, Lever, Moliner, Mundé, Nücke, Pinchancourt, Porak, Schulte, Warren.

² Cases of Bidder and Wassily; Moliner, cyst size of small pear; Pinchancourt, hen's egg; Warren, hen's egg.

³ Burke; Dupuy, cyst was voluminous; Fürst, goose egg; Hickinbotham, large; Ingleby, filled pelvis; Lever, Mundé, small orange; Nücke, hazelnut; Peters, child's head at term; Schulte, fist.

stances, a sound has been introduced into the urethra and bladder, and the endeavor has been made to feel its tip through the anterior wall of the vagina, in the recognition of cysts of this locality; or the effect of catheterization on the size and tensility of the tumor has been observed. Furthermore, the urine, withdrawn from the bladder by catheter, and the fluid withdrawn from the cyst by puncture, have been compared.

In cysts of the posterior wall, it is to be observed that the size of the tumor is not diminished after defecation, and that an enlargement in the vagina, due to an accumulation of feces in the rectum, is irregular and not circumscribed, and retains an impression made by the finger; while a cyst is elastic and resilient. Deahna, in an interesting study of retro-rectal cysts, shows that the posterior wall may be pushed forward by such tumors.

Duncan refers to the almost solid feeling that cysts sometimes have. Collardot records a case in which a fibroma was found attached to the anterior vaginal wall; it was soft, yet without distinct fluctuation, like a cyst with tense, rigid walls. Gosselin resorted to explorative puncture to determine whether a tumor of the vagina was solid or liquid.

It is easy to distinguish cysts of the vagina from polypi depending from the uterus.

With pelvic hematocele and pelvic abscess, with tumors and prolapses of the ovary and Fallopian tube, cysts of the vagina are not readily confused. The history of the case, sensitiveness on pressure, and the absence of any tendency to pediculization, distinctly mark out abscesses of the vesical or rectal tissues.

Perhaps the greatest difficulty is found in distinguishing cysts of the vagina from vaginal herniæ, and from cysts of the vulvo-vaginal glands or their ducts. In regard to the former, it has been observed that in vaginal cysts there is no impulse on coughing; they simply become more prominent, are forced down along with the whole of the pelvic contents, are dull on percussion, and irreducible. From cysts of the glands of Bartholin, cysts of the vagina may be differentiated by the fact that the latter originate invariably within the vagina, at a point more or less removed from the labia minora.

In spite of the apparent ease with which cysts of the vagina are said to be recognized, the most curious and unaccountable errors in diagnosis have occasionally been made, and pessaries

and tampons have been inserted and worn, when the prick of a needle would have made the apparent prolapse disappear.¹

We agree with Mundé that the diagnosis of cysts of the vagina is usually easy, and only gross negligence could lead to the mistakes that have been enumerated.

6. PROGNOSIS.

Cysts of the vagina are, of course, tumors of a benign nature and, as Eustache has with justice remarked, do not constitute a genuine malady, but rather an infirmity. They can, at most, interfere with function only; sometimes delivery may be seriously impeded by their presence. Klebs, believing, as he does, in the origin of cysts from dilated lymph-vessels, says that progressive lymphangiectasis may develop in consequence of these growths, and the subsequent incomplete involution of the lymph-vessels cause danger in later pregnancies.

7. TREATMENT.

Operation is unnecessary in every case of cyst of the vagina.

For those tumors that are large and cause trouble, there is no choice; and in young women it is best to interfere, even when the growth is small and produces no symptoms, for future difficulty and danger may be thus avoided. When a woman is entering upon the period of sexual repose, unless she is annoyed or suffers, the presence of the cyst should be disregarded.

Surgical procedures may be instituted at any time. In some instances, the operation has been performed during pregnancy, without there being any interruption in utero-gestation; or just before or during labor, either because the cyst is then

¹ Beaver's case. Diagnosis of a simple prolapse was made by several physicians.

Eustache's first case. Vulva was opened by a small tumor which was taken for a descent of the womb; for this woman wore a pessary for two months.

Eustache's second case. Projection from the vulva taken by physician for a prolapse of the vagina; treatment by tampons; woman got worse and physician thought she had a prolapsus of the uterus.

Gotthardt's case. Cyst projected between labia; midwife made diagnosis of prolapsus, and tried for its relief sponges, tampons, and pessaries.

Graefe's case. Cyst of the posterior wall; pessaries have been repeatedly inserted, but always fall out again.

Tillaux's case. Woman consulted physician, who, thinking she had cystocele, advised pessary.

recognized for the first time, or since it offers, or seems likely to offer, an impediment to delivery.¹ An almost countless number of operative methods have been proposed and practised, alone or in combination. There is some choice among them: that which is easiest of performance, freest from suffering or danger, and most likely to be radical in its results, is to be preferred. Especially in private practice do we desire to avoid the necessity of repeated attempts at cure.

The following plans of treatment are to be enumerated:

I. Simple Puncture.—Puncture of the cyst and the withdrawal of the contained fluid is useful as a diagnostic resource, and answers very well in the treatment of very small and superficially located tumors; but inflammation may be caused thereby, or the punctured opening may close, and the secretion re-accumulate. This plan of treatment was pursued in 25 of 162 collected cases: 12 cysts refilled; 3 completely disappeared; partial cure followed in 5; result not specified in 5.

II. Puncture, followed by the injection of an irritating fluid—tincture of iodine, carbolic acid, etc.—We seek by the injection of some irritating fluid into the sac to create an adhesive inflammation of its walls, and a consequent obliteration of its cavity. This plan of treatment is generally recommended, and is preferred to all others by many authorities. It is not always satisfactory in its results, being rendered entirely useless when inflammation already exists, and is apt to be followed, especially in deep-seated cysts, by a too active and a too extended inflammatory reaction. This procedure has been employed on seven occasions: 4 cures; 1 improvement; 2 results not specified.

III. Simple Incision.—Cysts may be incised in the long axis of the vagina or in a crucial manner, with the knife or actual cautery, care being exercised not to pass beyond the limits of the tumor and wound any of the adjoining hollow viscera or the peritoneum. A finger in the rectum or a sound in the bladder may be used as guides. Simple incision may suffice, but is not always effective. In 162 cases, simple incision was practised in 13, with 8 cures; 2 cysts refilled, and the result is not stated in 3 cases. In 1 instance, the cyst-walls were firmly approximated by deep sutures, and in 2 venous hemorrhage followed the operation.

¹ Cases of Bidder and Wassily, Betz, Burke, Ingleby, Lever, Mundé, Näcke, Porak, Peters.

IV. Incision, followed by an effort to alter or destroy the lining membrane of the sac.—After incision of the vaginal aspect of the cyst-wall, applications of iodine, carbolic acid, nitrate of silver, the actual canter, and tampons of cotton, charpie, etc., have been employed to alter or destroy the secreting membrane lining the sac, and set on foot inflammatory processes. The immediate object sought is usually achieved, but the subsequent cicatrization is often incomplete, the cyst-cavity communicating with the vagina by a suppurating track. In our own cases, this course was followed 6 times, with 1 failure. In 5 instances, the sac became obliterated after a shorter or longer period of suppuration. In one case, incision was followed by scraping of the interior of the sac.

V. Incision of the cyst, followed by excision of the borders of the wound, or removal of a part, or the whole, of the projecting portion of the sac.—This is a simple and effective procedure, but is not infrequently accompanied or followed by sharp hemorrhage. In large, thick-walled cysts, this method is particularly applicable. It has been employed in 9 cases, with good results in 7. In 1 it failed; in 1 the opening had to be subsequently enlarged; and in 1 there was enough hemorrhage to make a tampon necessary.

VI. Excision of the whole or a part of the cyst-wall, followed by the application of some irritant to its interior.—This mode of treatment, like some that have gone before, in which the effort is made to establish inflammation in the sac with an adhesion of its walls or an obliteration of its cavity by granulation and cicatrization, is generally followed by disappearance of the cyst, yet there are many objections to its employment. It is painful, frequent applications are often necessary, serious inflammation of the surrounding tissues may be caused, suppuration is prolonged, and a cicatrix is left behind. More suffering is occasioned the patient than was experienced from the presence of the tumor. In 19 instances, recovery was thus effected.

VII.—Enucleation or extirpation of the entire sac has been attempted.—This is a somewhat laborious undertaking in large, thick-walled, and deep-seated tumors; the rupture of the cyst, which usually occurs, and the accompanying hemorrhage, add not a little to the difficulties of the operation. In many instances, the attempt at extirpation has been abandoned in favor of some other simpler procedure. If it is successful, the edges

of the resulting wound may be approximated by sunk and superficial sutures, and drainage provided for at its lower angle. This operation is difficult and sometimes dangerous, and has no compensating advantages. Duncan characterizes it as an example of surgical greed.

In 162 cases, extirpation was undertaken 24 times, with 2 complete and 4 partial failures. It was accompanied by hemorrhage, requiring ligature, 5 times; was followed by consecutive or secondary hemorrhage, 4 times, and by peritonitis and death, once.

VIII. Schröder's Operation.—We have placed at the last that which may be considered, by all odds, the best operation for those cysts which cannot be cured by puncture or incision.

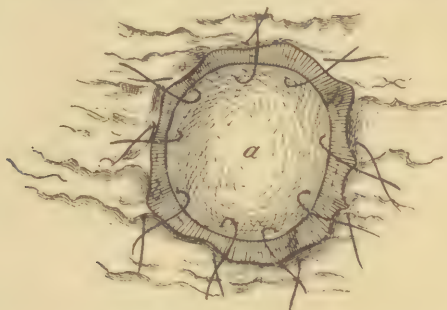


FIG. 6. (After Schröder.)

The operation consists in the removal, by scissors, of all that part of the tumor that projects above the surface of the vagina, and the union, by sutures, of the vaginal mucous membrane to the mucous membrane lining the cysts. Thus the sac is turned into the vagina. The epithelium, which invested the inner surface of the sac, is soon indistinguishable from that which covers the rest of the vaginal mucous membrane, the cup-shaped cavity becomes flattened out, and no trace of the tumor remains. This manner of operating has been recommended by Hegar and Kaltenbach, and has been adopted by Veit and ourselves.

IX.—There remain to be mentioned: ligature and section in pediculated cysts, through drainage, and the seton.

Altogether, in 112 cases of cyst of the vagina, 75 operations were performed. In 2 of these, there was hematuria for a few days after the operation, and in 1 cystitis; 2 cases terminated

fatally. In one of these, a cyst, seated in the posterior cul-de-sac (fornix) of the vagina, was removed, and, although the peritoneum was not injured, a fatal peritonitis resulted. In the other, solid nitrate of silver was twice applied to the interior of the sac, and the edges of the wound subsequently excised ; here also peritonitis followed.¹

Ether is said to have been employed four times and cocaine was twice used.

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¹ In both these fatal cases, the cyst originated posteriorly in the vagina, and was operated upon by Raynaud. It is not the same case twice described, for the account of one appeared two years before the specimen of the other was presented.

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A few cases have been recorded for which there are no independent references given.

For Beltz's case, see Pichancourt.

For Gordon's case, see Warren.

For Grynfeldt's case, see Eustache.

For Morlanne's case, see Dresch.

For Parks' case, see Churchill.

For Simpson's case, see Bradfield.

For Touatre's case, see Layton.

APPENDIX.

We insert at this point a brief outline of the histories of six additional cases of vaginal cyst, four, heretofore unpublished, having been kindly communicated to us by Dr. Paul F. Mundé, the other two cases having been observed by ourselves, after the completion of the preceding paper. The total number of cases, therefore, considered in this contribution is one hundred and sixty-eight.

MUNDÉ.

CASE I.—Multipara. Cyst size of a large lemon seated on posterior vaginal wall. Incision followed by excision of oval piece of wall; cavity painted with iodine and packed with cotton. It healed by granulation.

CASE II.—Nullipara. Two cysts, each size of small hen's egg, situated in vaginal vault, one to the left, the other in front of cervix. Incision; application of iodine; granulation.

CASE III.—Cyst of anterior wall, size of duck's egg, closely simulating and said to be cystocele. A Gehrung pessary had been inserted by a former attendant. Diagnosis easy. Excision advised.

CASE IV.—Virgin, æt. 21, complained of profuse yellow discharge. A small Sims' speculum carefully inserted so as to expose cervix without injuring hymen. Exposure of cervix impossible on account of a translucent elevation situated on left lateral vaginal wall, midway between hymen and cervix, the size of an English walnut. Puncture and escape of a tablespoonful of a thick brownish mucus. Cyst refilled and again punctured.

THE AUTHOR.

CASE I.—A Ipara, æt. 23. Cyst size of a large hazelnut, situated on anterior vaginal wall just back of meatus urinarius. Incision, escape of a teaspoonful of a thin yellowish, non-purulent fluid; a small piece of iodoform gauze placed in cavity; granulation, cicatrization.

CASE II.—A multipara, æt. about 36. A cyst size of a hazelnut situated on anterior vaginal wall, one-half inch from meatus urinarius. Puncture with hypodermic needle, withdrawal of syringeful of dark brown fluid. Patient passed from under observation.

